



# STEM Resources

STEM is the acronym for Science, Technology, Engineering, and Math. Check out this sampling of great resources featuring STEM topics, organizations, activities, and more!

## Books & Curriculum Materials

---

- Fowler, M. (1996). *Beginning lessons in engineering design: Level B lessons*. Austin, TX: Bar-None Publishing.
- Gibson, C., Harding, J., Hutchings, J., Mapstone, J. & Pengelly, B. (1995). *Rainbow technology: Techniques for primary design and technology*. Cheltenham: Stanley Thornes Publishers.
- Martinez, S. L. , & Stager, G. (2013). *Invent to learn: Making, tinkering, and engineering in the classroom*. Torrance, CA: Constructing Modern Knowledge Press.
- Roman, H. T. (2012). *Engineering insights – Working with simple materials to promote STEM thinking*. Pittsburg, KS: Hearlihy.
- Roman, H. T. (2012). *Paper and plastic cups: Lessons in engineering*. Pittsburg, KS: Hearlihy.
- Roman, H. T. (2012). *Spring and string: Lessons in engineering*. Pittsburg, KS: Hearlihy.
- Whiting, G., & Kirk, E. (2011). *Everyday STEM professional development workshop tools (unit 2): Using the design process in the elementary school*. Richmond, VA: Children's Engineering Educators, LLC.
- Whiting, G., & Hickey, M. (2010). *Children's engineering: Beyond the basics – highlighting the T & E in STEM education*. Richmond, VA: Children's Engineering Educators, LLC.
- Whiting, G., & Hickey, M. (2009). *Children's engineering: A handbook for elementary educators*. Richmond, VA: Children's Engineering Educators, LLC.
- Zubrowski, B. (1986). *Wheels at work: Building and experimenting with models of machines*. New York: William Morrow and Co.

## STEM Standards

---

### SCIENCE: Next Generation Science Standards

[www.nextgenscience.org/next-generation-science-standards](http://www.nextgenscience.org/next-generation-science-standards)

### TECHNOLOGY & ENGINEERING: Standards for Technological Literacy

[www.iteaconnect.org/TAA/PDFs/xstnd.pdf](http://www.iteaconnect.org/TAA/PDFs/xstnd.pdf)

### MATH: Math Standards and Expectations

[www.nctm.org/standards/](http://www.nctm.org/standards/)

---

*This resource list was compiled by Sharon A. Brusic, Department of Applied Engineering, Safety & Technology, Millersville University, Sharon.Brusic@millersville.edu; Updated October 2013*

---

## General Web-Based Resources

---

### Brain Cake

**[www.braincake.org](http://www.braincake.org)**

Do you want to change the world? Check out this site from The Girls Math & Science Partnership. Their mission is to engage, educate, and embrace girls as architects of change. It is primarily focused on efforts to promote support girls aged 11-17.

### Design Squad

**[pbskids.org/designsquad](http://pbskids.org/designsquad)**

Have you ever watched Design Squad on TV? There are all kinds of resources on this web site to help you and your students explore your creative and innovative side. Teachers will love the many activity ideas, incredible videos, and lots more!

### Engineer Girl

**[www.engineergirl.org](http://www.engineergirl.org)**

Includes engineering careers and profiles of female engineers. Full of fun facts, cool readings, and other links to good information. Mostly geared toward middle school level, but elementary teachers will also find some background information of interest here.

### Engineer Your Life

**[www.engineeryourlife.org](http://www.engineeryourlife.org)**

This is a great source of information about encouraging women in the engineering fields. This is a companion site for Engineer Girl, although this one is focused on the high school level. All educators will find some interesting information here that can help them feel better prepared to address these topics at the elementary level. Be sure to check out the video stories.

### Engineering By Design (EbD) Curriculum

**[www.iteea.org/EbD/ebd.htm](http://www.iteea.org/EbD/ebd.htm)**

EbD curriculum materials are available through the International Technology and Engineering Educators Association's STEM Center for Teaching and Learning™. This is a standards-based national model for Grades K-12 that delivers technological literacy in a STEM context. Curriculum materials are available for free to educators who live in consortium states (including PA).

### Engineering – Go For It

**[www.egfi-k12.org](http://www.egfi-k12.org)**

The site from the American Society of Engineering Education strives to identify and gather in one place the most effective STEM and engineering education resources available to the K-12 community.

### Engineering is Elementary

**[www.eie.org](http://www.eie.org)**

The Boston Museum of Science created the EiE curriculum to promote technological and engineering literacy for all children. This hands-on approach is creatively linked to specially designed children's books to encourage literacy along with STEM-related concepts. There is a cost involved to purchase this curriculum and resources.

### First Book STEM Resources

**[STEM.stem.firstbook.org/resources](http://STEM.stem.firstbook.org/resources)**

Download posters and educator guides (with activities and career information).

**FIRST Robotics Competition****[www.usfirst.org](http://www.usfirst.org)**

FIRST is For Inspiration and Recognition of Science and Technology. There are FIRST Robotics Competitions occurring around the country in grades K-12. FIRST is a not-for-profit organization devoted to helping young people discover and develop a passion for science, engineering, technology, and math through robotics competition.

**Maker Education Initiative****[www.makered.org/](http://www.makered.org/)**

The mission of this initiative is “...to create more opportunities for young people to make, and, by making, build confidence, foster creativity, and spark interest in science, technology, engineering, math, the arts—and learning as a whole.” Find out more about this initiative, locate resources, discover scholarships, and more!

**National Aeronautics and Space Administrations****[www.nasa.gov](http://www.nasa.gov)**

This government web site is full of STEM-related resources for students and teachers.

**National Science Foundation STEM Activities and Resources****[www.gk12.org/resources/stem-activities-and-resources-for-k-12-teachers-and-students](http://www.gk12.org/resources/stem-activities-and-resources-for-k-12-teachers-and-students)**

K-12 teachers and students will find a wide assortment of resources here.

**NEWTON Ask A Scientist Service****[www.newton.dep.anl.gov](http://www.newton.dep.anl.gov)**

Have a question about the world you're dying to ask? Ask a scientist your question or read the archives to see what other people want to know.

**Pinterest STEM Projects****[pinterest.com/mtreagan/stem-projects](https://pinterest.com/mtreagan/stem-projects)**

Visit this site for all kinds of stepping off points for STEM-related projects.

**A Sightseer's Guide to Engineering****[www.engineeringsights.org](http://www.engineeringsights.org)**

Explore ways that engineers improve our lives by visiting places and taking tours. This is a great site to search for good places to visit all around the country. Search here before you take your next family vacation. Site sponsored by the National Society of Professional Engineers.

**STEM Central at Sally Ride Science****[stemcentral.sallyridesience.com](http://stemcentral.sallyridesience.com)**

This is a great place to search for all kinds of STEM-related resources.

**STEM Education Coalition****[www.stemedcoalition.org](http://www.stemedcoalition.org)**

The Science, Technology, Engineering, and Mathematics (STEM) Education Coalition works to support STEM programs for teachers and students at the U. S. Dept. of Education, the National Science Foundation, and other agencies that offer STEM related programs.

**STEM Education Resource Center (PBS)****[www.pbs.org/teachers/stem](http://www.pbs.org/teachers/stem)**

This Public Broadcasting Service (PBS) site is a wealth of information and resources for K-12 STEM education. There are links to activities, videos, professional development opportunities, and much more!

---

## Organizations & Professional Development

---

### **Children's Council of ITEEA**

**[www.techhome.org](http://www.techhome.org)**

This organization is an affiliate organization of the International Technology & Engineering Educators Association (ITEEA) with the primary focus on elementary education. They sponsor professional development sessions at the national conference and make other resources and awards available.

### **Children's Engineering Educators (CEE)**

**[www.childrensengineering.com](http://www.childrensengineering.com)**

The members of CEE are experienced teachers who are dedicated to providing meaningful hands-on in-service programs for teachers and developing age appropriate technology-based teaching activities for the elementary level focused on all areas of STEM and more.

### **International Technology & Engineering Educators Association (ITEEA)**

**[www.iteaconnect.org](http://www.iteaconnect.org)**

This organization is one of the leading promoters of STEM education with emphasis on the T & E of STEM, areas which are often overlooked. They publish the *STEM Connections* electronic newsletter and two journals: the *Technology & Engineering Teacher* (focused on K-12 education, but emphasis on 6-12) and the *Children's Technology & Engineering* journal (focused on K-6 education). They also have K-12 curriculum materials (Engineering by Design – EbD) available for free download if you are in one of the consortium states (which includes Pennsylvania).

### **Technology & Engineering Education Association of Pennsylvania (TEEAP)**

**<http://www.teeap.org/>**

This is Pennsylvania's leading organization dedicated to the promotion of STEM education, especially technology & engineering education from kindergarten through college. They sponsor an annual conference and access to resources and information of benefit to educators.

### **Virginia Children's Engineering Council**

**[www.childrensengineering.org](http://www.childrensengineering.org)**

This organization has been a national leader in the promotion of STEM & Children's Engineering. They have sponsored an annual convention in Virginia that brings together elementary teachers and other educators for professional development, teacher demonstrations, and a showcase of resources, including vendor exhibits.

---

## Videos

---

### **National Center for Technological Literacy, STEM Speech by Ioannis Miaoulis (~6 minutes)**

**[youtube.com/watch?v=4B-g1\\_6QCWU](https://youtube.com/watch?v=4B-g1_6QCWU)**

This short video provides an excellent overview of the need for more STEM education in schools. Ioannis Miaoulis is the President and Director of the Museum of Science in Boston. He is also the founding Director of the National Center for Technological Literacy.

### **Project Lead the Way (PLTW) Launch Kickoff (~3 minutes)**

**[youtube.com/watch?v=jEiBf33RM3s](https://youtube.com/watch?v=jEiBf33RM3s)**

This video describes a new PLTW elementary program that is expected to be fully launched by Fall 2014. The program is already successfully in place in middle and high schools. The K-5 program is hands-on, project-based learning that engages students in STEM learning.